selectively adsorbing oxygen to produce nitrogen with a purity ranging from 99% to 99.999% by using the pressure swing adsorption (PSA) method that conducts regeneration of the adsorbent under atmospheric pressure, wherein

a period "TO" needed for the carbon molecular sieve to adsorb an oxygen amount of 50% of a saturated oxygen adsorption amount starting from the beginning of oxygen supply is 5~10 seconds, and a period "TN" needed for the carbon molecular sieve to adsorb a nitrogen amount of 50% of a saturated nitrogen adsorption amount starting from the beginning of nitrogen supply is larger than "TO" by more than 41 times.

4. An apparatus for producing nitrogen with a purity ranging from 99% to 99.999% using air as a raw material, comprising:

an air compressor for compressing the air;

a dryer for removing water from the compressed air;

at least one adsorbing column into which the dried and compressed air is conducted, the adsorbing column being filled with an adsorbent that selectively adsorbs oxygen; and

a product tank for temporarily storing a nitrogen product conducted out of the adsorbing column after oxygen is removed in the adsorbing column, wherein

in said at least one adsorbing column, an adsorption step and a depressurization regeneration step are switched alternatively and periodically to implement a pressure swing adsorption (PSA) process, wherein the adsorption step comprises conducting a raw air compressively into the adsorbing column, and the depressurization regeneration step comprises releasing a compressed gas under atmospheric pressure after the adsorption step; and

the adsorbent is a carbon molecular sieve that selectively adsorbs oxygen, which adsorbs an oxygen amount of 50% of a saturated oxygen adsorption amount with a period "TO" of 5~10 seconds starting from the beginning of oxygen supply, and adsorbs a nitrogen amount of 50% of a saturated nitrogen adsorption amount with a period "TN" starting from the beginning of nitrogen supply, wherein TN is larger than TO by more than 41 times.

REMARKS

Present Status of the Application

The Office Action rejected all presently pending claims 1-4. Specifically, claims 1 and 4 were rejected under 35 U.S.C. 103(a) as being unpatentable over Auvil et al. (US 5,240,474), and claims 2-3 were rejected under 35 U.S.C. 103(a) as being unpatentable over Auvil et al. in view of Gemba et al. (US 4,925,461). Claims 1 and 4 have been amended to more explicitly and more clearly describe the claimed invention. Support for the claim amendments can be found in the specification. It is believed that no new matter is added by way of these amendments made to the claims or specification or otherwise to the application. Reconsideration of claims 1-4 is respectfully requested.

Discussion of Rejections under 35 U.S.C. 103(a)

Rejections of Claims 1 & 4

Independent claims 1 and 4 were rejected under 35 U.S.C. 103(a) as being unpatentable over Auvil et al. Please note that claims 1 and 4 have been amended.

The features of claims 1 and 4 include: *a period "TO" needed for the carbon molecular*